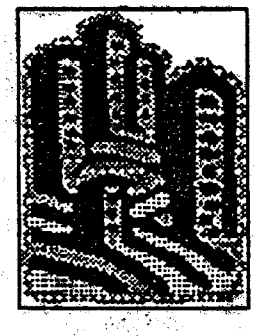
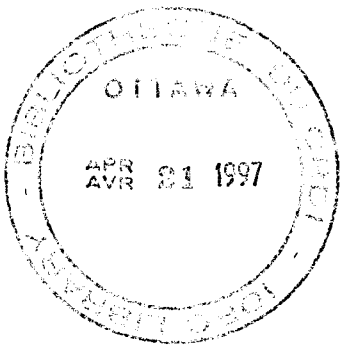
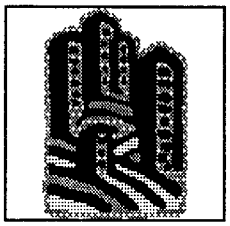
Urban Agriculture in Canada: A Survey of Municipal Initiatives in Canada and Abroad

by
Michel Frojmovic,
Urban Planning Consultant
1996



Cities Feeding People Series
Report 16





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Introduction

Urban agriculture(UA) can be defined as the procurement of food and non-food products through cultivation, animal husbandry, forestry and aquaculture within and/or on the fringe of urban areas. Research related to UA activity in the cities of Africa, Asia and Latin America has focused largely on its contribution to enhancing food security, nutritional health and revenue generation. The documentation of urban agriculture activities in the North has focused less on the theme of food security. Instead, the practice of UA in the cities of North America and Europe has been shown to be motivated more by environmental, fiscal and recreational factors (CFP Reports #9 and #11).

One theme which cuts across UA in the cities of both the South and the North is the role of municipal government in creating an environment conducive to UA. At a minimum, municipal administrations have shown benign neglect towards UA producers dependent on free access to vacant or underused municipal land. Ultimately, the vibrancy and health of urban agriculture depends on the level of active support from municipalities.

This report provides an assessment of the role of Canadian municipal authorities in supporting and promoting initiatives related to urban agriculture. These initiatives are presented in six category headings. These include solid waste management, urban forestry, urban gardening, urban husbandry, wastewater management and water resources management.[1] Each section contains an overview of municipal initiatives, as well as case studies highlighting each of the six categories. In addition to initiatives within Canada, the report makes reference to initiatives being assisted by Canadian municipalities in developing countries through an International Municipal Partnerships Program. The report suggests that, although Canadian municipalities generally do not provide explicit policy and program support for UA, municipal initiatives motivated by fiscal and environmental agendas are effectively promoting a diversity of UA-related activities.

This paper responds to a number of requests addressed to IDRC's Cities Feeding People Program Initiative, since 1993, regarding the nature and extent of Canadian experience in urban agriculture. This experience can be said to exist with municipalities, non-governmental organisations -producers included- and scientific and technological research institutions. This paper attempts to summarise, categorise and illustrate the diversity of recent policies, programs and projects, initiated by the larger community of municipal authorities. It is based on a survey of central directories (see references). Consequently, the actual number and range of municipal initiatives underway, their evolution and achievements, are probably under-represented in this report. However, it is hoped that this first reference will trigger interest for more systematic surveys, in-depth assessments and creative partnerships in urban agriculture, both in Canada and abroad.

[1] The paper is based on nearly 250 initiatives related to urban agriculture drawn from the Canadian Municipal Environmental Directory published by the Federation of Canadian Municipalities. As such, the paper reflects the environmental orientation of these initiatives.

Solid Waste Management

The strongest and most positive link between Canadian municipal initiatives and urban agriculture is in the municipal solid waste management sector. A powerful agenda driving solid waste management initiatives in Canadian municipalities is grounded in a desire to divert the amount of waste traditionally destined for municipal landfill sites. Most common in this regard is the prevalence of a range of waste recycling programs associated with paper, glass and metal waste. However, it is the growing prominence of recycling of organic waste, in the form of composting initiatives, that is having the most significant impact on the role and extent of urban agricultural activities in Canadian municipalities.

While the motivation behind composting initiatives rests with the desire to reduce the amount of solid waste produced in Canadian municipalities, an important outcome of these initiatives is the growing use of composted organic waste for urban gardening. This includes gardening undertaken both by individual homeowners, as well as municipal departments themselves. In addition to protecting the environment, the use of composted organic waste in gardening is less expensive than fertilizers and topsoils.

Broadly speaking, composting initiatives include homeowner composter programs and municipally operated, centralized composting facilities. This section discusses the types of organic waste used in composting, the types of programs offered in support of composting, the different ways in which composted waste is used, and the organizational structures in place to execute these programs. Two case study municipal programs are provided at the end of the section.

The two most common sources of organic material originate from municipal government activities and residential activities. In the case of the former, these include waste resulting from the routine maintenance of municipal parks, open spaces, and green boulevards along city streets. This waste includes leaves, grass, and tree and bush clippings. Residential waste used in composting includes yard waste (leaves and grass) and food-related waste. There are also instances of more seasonal organic waste generated by residents, such as Christmas trees.

Homeowner Composting

A core component of municipal organic waste recycling rests with encouraging the participation of individual homeowners. The most common initiative being implemented by municipalities as part of these "do-it-yourself" programs, is the distribution of indoor and backyard composters. This includes both the sale of subsidized composters, and in some cases, the distribution of composters free of charge. In at least one instance, a municipality sponsored a program which resulted in the design and manufacture of composters locally. In general, indoor composters are used for food waste, while outdoor composters are intended for the recycling of yard waste.

In addition to the distribution of composters, municipalities are also engaged in the active promotion of composting through a range of public information programs. A typical municipal initiative involves the use of publications which are generally made available free of charge to residents of the municipality. These publications serve to explain both the value of composting,

provide instructions regarding the use of composters and compost, and provide residents with updated information on waste management issues. Publications are designed in the form of community newsletters, flyers, "how-to" guides, and even videos with names such *as Waste Action Newspaper*, *Here's the Dirt*!, *Compost Resource Manual*, *The Guide to Worm Composting*, *Don't bag it...your lawn will love it*, *Composting is easy...spread it around*; and *Landfill-the musical* (video).

A second mechanism for promoting the reliance on composting is achieved by means of municipally sponsored Compost Education and Demonstration Centres. These resource centres offer training on outdoor and indoor composting through workshops, and guest lectures. A popular programming initiative is to conduct workshops at schools, and expose school children to outdoor composting and indoor worm composting.

Residential composting is also promoted through policies restricting the collection of certain kinds of waste normally collected through the municipal waste management system. For example, the composting of yard waste is often encouraged by the refusal of many municipalities to collect leaf waste and grass clippings.

Centralized Municipal Composting Facilities

The second core element of municipal composting initiatives is the establishment of centralized, municipally operated composting facilities. These centralized facilities are normally located at a municipal landfill site, and service the entire community, if not an entire region. The organic waste collected by the municipality is generated by residential homeowners, the Institutional, Commercial and Industrial (ICI) sector, as well as by the municipality itself. Maintenance of a centralized composting site is very low, generally consisting of no more than turning over a heap or organic waste once or twice a month with a front-end loading truck.

The collection of organic waste destined for the centralized composting facilities is often based on a "three stream waste collection" system. This involves the integrated collection of garbage, recyclables, and compost waste streams. Another aspect of the compost collection system is the use of a "Wet/Dry" recycling method. This requires that all waste collected by the municipality be separated into wet for composting and dry for recycling. While this method is already being used in Europe, very few Canadian communities use an integrated wet/dry system on a city-wide basis. The arrangements in place for the collection of organic waste are generally carried out by waste management companies contracted by the municipality. In one instance, a local demolition waste landfill agreed to take compostable yard wastes from residents free of charge for use in an on-site composting operation. There are also some instances of community-based collection systems in place.

The Industrial, Commercial and Institutional (ICI) Sector

A growing number of composting initiatives have begun to address the organic waste generated by the ICI sector. However, municipal initiatives involving the composting of ICI-generated organic waste are still at a relatively undeveloped stage. The greatest attention has been paid to

commercial and institutional organizations such as business offices and schools. In particular, initiatives in this sector have focused on recycling organic waste generated in cafeterias.

While municipal workshops on composting have been held at schools, there are considerable challenges being faced in the ICI sector. These include problems with the proper maintenance of composters at schools and offices. In particular, there tends to be a lack of leadership necessary to ensure proper use of composters. Schools are faced with the additional problem of properly attending to composters during the summer vacation. In order to serve as an example to others in the ICI sector, some municipalities are initiating composting programs at city cafeterias. The composted organic waste is then used in municipal demonstration gardens. In general, the private sector is being left to carry out their own organic recycling. However, many larger firms, such as supermarkets, are doing a good job on their own.

While the motivation underlying the promotion of composting by residents, businesses, schools and municipalities themselves is based on a desire to reduce the volume of solid waste entering expensive and overburdened landfill sites, one important outcome of these initiatives is to promote urban agricultural activities. The increasingly wide availability of composted organic waste is serving as an incentive for homeowners interested in carrying out urban gardening in an inexpensive and environmentally friendly way. Composted waste is also used by homeowners for a range of other purposes, including as a mulch placed around the base of houses and trees, insulating them for winter protection.

Composted organic waste is also being applied by municipal Engineering, Parks, and Recreation departments for a wide variety of agricultural purposes on municipal lands. These include tree planting, landscaping, flower beds and soil amendment projects. There are also instances where municipalities are bagging and selling compost to members of the public, retailers, landscapers and even other municipalities.

In delivering their composting programs, municipalities employ a variety of formal and informal institutional mechanisms. In smaller municipalities, composting programs are most commonly delivered by attaching responsibilities to an existing departmental manager or member of staff. More developed composting programs are placed within broader, integrated recycling or waste management strategies and include staff hired and trained specifically in the area of compost program development. However, most municipal composting programs are at a relatively early stage of development and are limited to one or two members of staff.

In addition to relying on their own staff, municipalities often work in partnership with community-based organizations. In some cases, municipalities assist in training individual volunteers who then act as resource persons within their community.

CASE STUDY 1 Greater Vancouver Regional District(GVRD), British Columbia
Pop. 1,542,744

Name: Residential compost program
Objectives: (1) Reduce organic waste sent for disposal by composting, mulching and grass cycling (clipping grass and letting clippings fall) This year's objective is to increase the number of residents involved in composting by 1% of the region's population.
(2) Provide training, educational resources, and support to member municipalities for the delivery of education promotion programs in organic waste reduction at source. In the future, reducing waste generated by the ICI sector will be one of the main driving forces.
Origins: Developed following GVRD board approval in 1990 of a 1989 report which addressed strategic goals regarding waste reduction and recycling. The program is a cooperative venture between the City of Burnaby, the region, and the province.
Summary: The program includes elementary school workshops, outreach programs for residential residents, adult workshops, and garden visitors. The garden, which is designed as a residential backyard, includes a training centre for municipal staff, school classes, master gardeners, and the public on the art of composting. A 1991 survey showed that 37 percent of the population was already composting. A 1996 poll indicated that composting is now at 44 percent. Within this number, 60 percent of regional residents living in single family homes are composting.
Start date: Garden built in Fall, 1990. Program started in March 1991.
Contact: Bev Weber, Compost Program Officer
Greater Vancouver Regional District
Tel (604) 436-6803
Marie Grigg, Communications and Education person responsible for Urban Agriculture Month
Tel (604) 436-6826

CASE STUDY 2 Port Colborne, Ontario Pop. 18,766
Name: Earth-Works Composting Pilot Project
Objectives: Achieve maximum on-site backyard composting and maximum organics diversion from landfill. Diversion would be to a central composting site in the case of ICI-generated organic waste, and yard composters in the case of residential waste.
Origins: The idea for the project originated with a waste management company which proposed the idea to municipal council. Council then applied for funding to the Provincial Ministry of Environment and Energy. Provincial funding was the major motivation for this series of initiatives. The initiative was used as a pilot study for composting and waste diversion for smaller municipalities.
Summary: The first four to six months were focused on the residential component of the project. Free composters were offered to every home in the community through door-to-door knocking. Residents were also offered composting literature, and demonstrations on the use of the composter. Free units were available up to 1995. Students were hired through a Provincial Environmental Youth Corps program to do follow-up visits one month later to answer any questions regarding the use of the composters. Various other initiatives in the residential sector were undertaken in the area of promotion, public education, workshops, and school presentations.

Solutions were also sought for the ICI sector. From the beginning of 1994, a centralized composting site was built to handle up to 4,000 tonnes of material. This is collected mainly from the city, but also from across the province. Waste audits were carried out in the summer of 1993 at all ICI establishments in the City. Many of the smaller firms were offered weekly curbside collection program for all organics (restaurants, flowershops, barbershops, etc...) Larger generators of organic waste, such as a flour mill, cornstarch refinery, were offered free access to the centralized facility for free dumping of organic waste by waiving any tipping fees. In October 1994, a Waste Management by-law was passed which banned leaf and yard waste collection by the City. ICI organic waste (more than 5 percent of total waste) was also banned from collection/disposal.
Leaf and yard waste collection for the centralized facility is carried out once in May and in the fall. In addition, leaves and woodchips are collected from nearby municipalities. Composted material from the centralized site is sold to landscapers and residents.
Port Colborne is a member of the Regional Municipality of Niagara Recycling Club. 11 of 13 municipalities are involved in the club. This project strengthened existing programs.
Start date: Program initiated in spring 1993.
Contact: Robert Cotterill, PEng, Manager
Operational Planning and Development Services
City of Port Colborne
239 King Street
Port Colborne ON L3K 4G8
Tel (905) 835-2900 Fax (905) 834-5746

International Partnership Initiatives
The review of municipal initiatives carried out in developing countries in partnership with Canadian municipalities addressed only a limited number of programs oriented towards urban agriculture. Unlike the Canadian perspective, these initiatives tended not to be concerned with goals of waste reduction. Instead, the priority motivating these initiatives was overwhelmingly focused on increasing basic residential waste collection and disposal services.

Two initiatives did involve the implementation of composting programs. One involved a partnership between the Cities of Jinja, Uganda and Guelph, Ontario; The second involved a partnership between the Cities of St. Louis, Sénégal and Lévis, Québec. Both of these initiatives placed composting within the context of garbage disposal.
*Provide better refuse collection and disposal for the community and attempt a composting experiment. The community could be better served with a well organized dump site and composted material for agricultural use.
*Investigate possibilities of recycling domestic refuse, introducing composing, and incinerating refuse from the hospital.

Urban Forestry

A second area where municipal initiatives have contributed to urban agricultural activities in Canada is with respect to urban forestry. The urban forest is important to an urban setting, economically, aesthetically and environmentally. Healthy trees enhance the appearance of city streets and parks. They help cool and clear the air, provide site screening, shade, deaden sound and help to control erosion. They also attract many species of wild birds and animals into urban areas. The economic benefits of trees include reduced energy use, contribution to tourism and increased property values. In rural or natural areas, trees require very little care. Most of their needs are provided by the environment. The soil is light and nutrients are replenished by decomposing leaves and other dead plant material. The urban environment is not as friendly. Construction, overhead wires, varying water table levels, pedestrian and vehicular traffic, air pollution, the use of chemicals, extensive asphalt and concrete areas and snow removal operations, all have a detrimental effect on the health of a city's trees. In addition, many urban trees not in their natural habitat are under a great deal of stress and become susceptible to insect infestation and disease.

Canadian municipalities are actively involved in addressing the challenges inherent in managing and maintaining the urban forest. Urban forestry initiatives can be divided into three categories. The first includes carrying out extensive and continuous tree planting on municipal property. The second category involves promoting tree planting on private property. The third category comprises programs and policies aimed at ensuring the maintenance and preservation of existing trees growing on municipal property. These initiatives generally take place within the context of municipality-wide urban forest management strategies, frameworks and plans.

Two case-study initiatives are presented to illustrate Canadian municipal initiatives in the area of urban forestry.

Tree planting on municipal land

The traditional, and most common, focus of municipal programming related to urban forestry focuses on planting of trees on municipal lands. These programs include tree planting undertaken directly by the municipal authorities themselves, and tree planting on municipal property facilitated by the municipality and involving residents and community groups.

Tree planting initiatives undertaken directly by the municipality occur in various forms. Generally, these are based on replacing or increasing the number and diversity of street trees. Specifically, programs include planting trees as part of all pavement and curbing local improvement projects, and main street beautification programs. One initiative included the construction of sidewalks on piles, enabling a large amount of soil to accumulate underneath. Another brand of program involves setting goals for a specific number of trees. Under a federally-funded program, municipalities are setting tree planting goals for the year 2000, ranging up to 200,000 newly planted trees. A third approach is to undertake educational initiatives focused on trees. These include planting model forests and accompanying interpretation programs.

Municipal authorities also solicit the support of community-based organizations in order to facilitate the planting of trees of municipal property. A popular mechanism is to support tree planting days on an annual, or bi-annual basis.

Tree planting on private property
A second major component of urban forestry management is to promote the planting of trees on private property. These are divided into three types of initiatives. In many cases, a municipality will distribute trees to homeowners on annual'basis, free of charge. This includes distribution of a limited number of trees on a first-come, first-serve basis, more comprehensive distribution of trees to residents interested in planting trees on their property, and policies which provide all new homeowners with trees. A second type of initiative involves the sale of trees by the municipality to residents, often at reduced prices. Finally, there are instances where municipalities will pay homeowners to plant trees.

Municipal tree preservation and maintenance programs
A second traditional municipal programming focus is on the maintenance of the existing urban forest. Current tree maintenance programs emphasize the importance of preventing disease, thereby avoiding the need to cut down trees entirely. This is in contrast to historical maintenance techniques which resulted in relatively larger removal and destruction of trees. This has required the development of a range of tree maintenance techniques. One innovative technique involves spraying street trees with biological products harmless to people and animals, while beneficial to insects such as honey bees.

In order to avoid the removal of trees, an important component of urban forest maintenance involves the protection of existing trees. This is implemented by means of a wide range of preservation by-laws, policies, and programs. Examples of these initiatives include the preservation of heritage trees on public and private property, a boulevard tree protection program which is intended to protect trees during new construction projects, and the preservation of wooded lands by means of designating wooded areas as parklands. In one case, a municipality implemented a policy whereby any plant material threatened by development is transplanted to municipal parks and public buildings.

CASE STUDY 3 City of Medicine Hat, Alberta Pop. 45,892
Name: Land Sale Subdivision Tree Program
Objectives: The purpose of the program is to hasten the establishment of a tree canopy along the perimeter of the city where development is taking place. At present, this perimeter is bald prairie land.
Origins: This initiative replaced an earlier program where trees were planted on boulevards in new subdivisions. However, current subdivisions no longer include boulevards.
Summary: Lands sold by the city include a price for two trees per lot. A voucher prepared by the Land Sales Department is provided to the new landowner upon purchase. Where a developer purchases and subdivides the land, the vouchers are passed on from to the eventual homeowners. For the first three years following the purchase of their lots, homeowners are eligible to redeem their vouchers in exchange for two trees. Vouchers are presented to the Parks

Department which provides the trees. The vouchers are then passed on to the Land Sales Department. Currently, the City provides 6 to 8 foot trees, and 15 different species. The lots tend to be small, so residents prefer smaller trees. More popular trees include flowering crabs, cherry trees, snowbird hawthorn, and apple trees. Participants in the program phone the city to let them know about any problems with the trees.
Proposed changes to the program would see privately owned tree nurseries providing homeowners with trees in exchange for the vouchers. These private companies would then submit the vouchers to the city for reimbursement. It is anticipated that the nurseries would be in a position to provide a greater diversity of tree species.
Start date: This program has been ongoing since 1988.
Contact: Trevor Rayner, Superintendent Horticultural Services, Parks Department
Albert Naiman, Land Sales Department
City of Medicine Hat
580-1st Street S.E.
Medicine Hat AB T1A 8E6
Tel (403) 529-8220 Fax (403) 529-1690

CASE STUDY 4 City of Ottawa, Ontario Pop. 313,987
Name: Urban Forest Maintenance Strategy for Corporate Trees
Objectives: A conservative estimate of the value of City-owned trees is between sixty and eight million dollars. In order to preserve these trees, the city provides an extensive maintenance program. These are supplemented by planting programs designed to sustain the urban forest. The maintenance strategy is aimed at redistributing available resources to activities that will bring the most benefit to the urban forest.
Origins: In response to budgetary constraints, the city decided to implement a forest maintenance strategy that targeted areas requiring more maintenance than others. Despite the fact that conditions affecting trees vary throughout the city, the previous maintenance strategy had provided the same level of maintenance to all street trees. The strategy will include the development of maintenance zones which will allow the City to target areas requiring special attention.
Summary: Over the years, the development of wider streets, public utilities and the need for more office space meant that more and more trees were being destroyed. Trees that survived lost most of the surrounding green spaces to concrete and asphalt. Meanwhile urban conditions worsened with the introduction of ground-based and airborne pollutants and the use of greater numbers and faster vehicles. Today, life expectancy of a newly planted tree in the downtown area is between seven and twelve years.
Tree maintenance programs in the City of Ottawa have undergone many changes. In the early 1950s the City initiated an aggressive tree-planting program that included a tree replacement policy. The 1960s and the 1970s saw the onset of Dutch Elm Disease. Thousands of American Elm trees were removed from city streets, parks and private property. The City's planting programs were enhanced during this period. A cooperative tree planting program was initiated whereby property owners would pay for the cost of a tree and the City would plant the tree on the municipally-owned portion of the boulevard.

In the late 1960s and early 1970s pruning of trees was carried out mostly on a complaint basis. This type of trimming was found to be more expensive and sometimes resulted in the loss of the tree. In the mid- to late 1970s a routine tree-pruning program was established whereby all trees were pruned on a five-year cycle. The City also expanded the number of tree species being planted throughout the city. This was expected to avoid devastating losses to the inventory, similar to those occurred as a result of Dutch Elm Disease.
Between 1975 and 1985, insect control, fertilizing and watering programs were introduced to complement the pruning program. The Do It Yourself tree-planting program was introduced as an alternative means of adding trees to the total urban forest. A computerized inventory system was created for the City's street trees.
The most recent urban forest maintenance program provided the same level of service for all street trees city-wide and included a reactive maintenance program for parks trees. Under this program, 89 percent of total urban forest maintenance program was spent on street trees and the remainder was allocated to parks trees. Program activities consisted of:
*regular street-tree pruning on a five to seven-year cycle, a limited park-tree pruning program, response to complaints and storm damage, for a total of approximately 12,000 trees pruned annually;
*watering newly planted trees once or twice after planting and watering young trees when signs of drought are evident;
*fertilizing newly planted trees and trees showing signs of stress; and,
*insect and disease control using insecticidal soap and Malathion on an as-required basis.

Watering and pruning are considered the most important operations in sustaining healthy trees. New trees came from the following planting programs:
*The Tree Replacement Program: requires that all trees removed be replaced in a nearby location.
*The Routine Tree Planting Program: provides for the planting of trees in newly identified spaces
*The Do-It-Yourself Tree Planting Program: designed to provide three centimetre trees for a nominal fee ($10) to residents of the city for planting within the city on private or public property.
*The Commemorative Tree Planting Program: available to people who wish to commemorate an event or person.
*Other important sources of new trees are the site plan control, subdivision approval processes and park developments and redevelopments.
Start date: The most recent program started in 1994, though the City has had a Tree Maintenance strategy since the 1950s.
Contact: Brian Smith, Operations Branch
Department of Engineering and Works
City of Ottawa
111 Sussex Street
Ottawa ON K1N 5A1
Tel (613) 244-5300x3771 Fax (613) 244-5430

International initiatives
*Children's treeplanting- an initiative of the city of Francistown, Botswana and the City of Swift Current, Saskatchewan.
The objective is to plant trees around the school yards as a means of increasing vegetation and educating children
*Tree nursery Project-an initiative of Jinja, Uganda and the City of Guelph, Ontario.
The project is intended to replace much needed tree vegetation in Jinja both to prevent erosion and provide fuel for cooking. The forests of Jinja, the second largest city in Uganda, have been devastated by land-clearing for crops and vegetable gardens. Approximately 96 percent of Ugandans depend on wood for cooking fuel. As the population grows, wood products are needed for building and other community needs, such as erosion and drought prevention.

Urban Gardening

Urban agriculture is most commonly associated with a range of farming, gardening and horticultural practices within and around the city. On the one hand, municipal initiatives related to urban agriculture in Canada tend to be more immediately concerned with issues of environmental conservation, economic efficiency, and recreation, rather than food production. Consequently, it is not surprising that the issue of urban gardening is not considered a high priority by municipal officials. At the same time, Canadian municipalities have initiated a limited number of programs which directly address urban gardening.

The urban gardening programs addressed by this review focused on three areas. These included demonstration gardens, organic gardening courses, and community gardening programs.

Demonstration gardens
Many of the urban gardening programs initiated by municipalities were linked to the composting and waste reduction agenda. Urban gardening is being promoted to encourage the application of composting techniques. One popular approach for promoting organic gardening in an urban setting is by means of a demonstration garden. These gardens are operated and maintained by municipal staff or volunteers recruited by the municipality. Members of the public are encouraged to visit the gardens and be exposed to the idea of gardening in an urban setting. Special programs are designed to attract schools, community groups and municipal staff groups.

Organic gardening courses
A more specific program aims at providing potential and practising urban gardeners with training in the skills and techniques related to organic gardening. These courses also provide information on indoor and outdoor composting.

Community gardening programs
A third area related to urban gardening involves the support of community gardening organizations. The focus of these organizations tends to be recreational, with a significant component of seniors. The municipalities contribution includes providing access to vacant municipal lands, as well as providing information on gardening and composting techniques.

CASE STUDY 5 Township of Goulbourn, Ontario Pop. 16,151
Name: Environmental Youth Corps Organic Garden
Objectives: The organic garden demonstrated how inorganic fertilizers do not have to be used in order to have a healthy and successful crop; and that such a natural garden can be just as successful and even more economically feasible in the long run.
Origins: Original recommendation for the program came out of a member of the Township's environmental advisory committee who was also a master gardener. Funding was secured under a provincial Environmental Youth Corps Program to hire several summer students.
Summary: During the summer of 1991, several students hired under the Provincial government's Environmental Youth Corps Program, designed a demonstration organic garden to demonstrate to the urban public that a small garden, which could fit in the rear yard of any urban lot, could generate enough vegetables and herbs for a family without using chemical fertilizers or pesticides. A site in front of the municipal garage was chosen, within reach of the outdoor sprinkling system. This site was highly visible and accessible to the public.
While the program was not formally continued beyond 1991, the originator of the idea continues to maintain the garden on an informal basis. The program stimulated the design of a yard composter, the commercialization of the composter by the Township and its subsequent distribution. The garden itself was used to demonstrate the viability of the composter and composting methods to residents. Lawn waste from a large lawn adjacent to the Town Hall is now used for composting at the demonstration garden.
Start date: These students developed the recommendation and implemented a demonstration garden during the summer of 1991.
Contact: Lee Boltwood, Member, Environmental Advisory Committee
Township of Goulbourn
PO Box 189
2135 Huntley Road
Stittsville Ontario K2S 1A3
Tel (613) 836-1491 Fax (613) 831-2279

International initiatives
Several market construction and reconstruction projects
*Project 1: Kwekwe, Zimbabwe-City of Fort McMurray Alberta
The objective was to construct a public market place through a community-based effort. A well planned market can facilitate a land-use project that is economically self-sustaining and contributes to local income. The new market will provide enhanced water servicing, effective refuse disposal facilities and better stalls.
*Project 2: Mutare, Zimbabwe-City of Nelson, British Columbia
Dangamvura is a new, growing and high density suburb in the City of Mutare which is lacking infrastructure, combined with a serious shortage of retail and commercial outlets. The construction of a new market in this area means residents need not walk 13 km. to an already established market area. It will also improve socio-economic opportunities and the viability of the area.
*Project 3: St. Louis, Sénégal-Ville de Lévis, Québec

The objective is to rationalize and improve land use and transportation accessibility in the city centre by redeveloping and expanding upon the present market site. Commercial regulations governing market activity will also be adapted, promoting better financial returns for the municipality from market activities. By enlarging the market place, there will be more room for stalls and improved traffic routes. More space would also allow for the planting of trees and gardens which would contribute to civic pride and add to greenspace in the urban core.
*Project 4: Bo, Sierra Leone-City of Nepean, Ontario
The objective is to renovate existing market facilities and construct additional facilities at the original site. Will have a significant positive impact on women, who dominate market activity. Market will also facilitate improved use of urban space with the completion of office, storage areas, market stalls and toilets.

Urban Animal Husbandry

Urban animal husbandry includes the raising of livestock, including cattle, fowl, and fish in and on the margins of cities. While the review of Canadian municipal initiatives did not provide any indication that urban husbandry is being promoted for the purpose of consumption, there is one program which addresses the rearing of sheep within urban boundaries. The focus of this highly popular program, presented as Case Study 6, is on rearing a flock of sheep to be used in the maintenance of lawns in municipal parks. Using livestock to maintain urban grasslands in parks and rights-of-way is viewed as being both fiscally sound and environmentally friendly.

Municipal by-laws which forbid the rearing of livestock in residential areas are explicit and widespread in Canada. Whatever livestock rearing takes place within a municipality is highly regulated and formalized. Restrictions against urban husbandry receive wide support among residents of municipalities. As a result, municipalities still face serious challenges in attempting to carry out park maintenance using sheep or other livestock. In principle, residents view such an initiative with suspicion and concern and treat the idea of urban husbandry as being substandard. While husbandry may still be perceived generally as being substandard, high value husbandry targeting high income clientele is becoming more popular in peri-urban communities, and microlivestock among immigrant groups in large metropolitan centres.

CASE STUDY 6 City of Fort Saskatchewan, Alberta Pop.12,078
Name: Sheep Grazing Pilot Project (Alternative Turf Maintenance Program)
Objectives: Save money, be environmentally friendly.
Origins: The original concept was derived from an idea brought forward to the City Employee Suggestion Program by Don Siemens, Parks and Open Space Foreman. Don, along with Ovine Enviro Systems, presented a detailed report to City Council. Council approved the program on a trial basis to be run from June 21 to September 5, 1992.
Summary: The program was based on the use of sheep for vegetation control within a city. The program originally involved 235 sheep, including one lamb that was born in the city .While sheep have been used for hundreds of years for this purpose, this was the first initiative of its kind in Canada. The trial program covered three sites on approximately 100 acres of municipal land, most of which included difficult terrain to maintain by conventional means. The program

cost $15,000 to $20,000, including the shepherd and dogs, transportation of the animals, capital costs, health certification, consulting fees and the rental of the sheep. However, the City is saving the same amount of money it would have otherwise spent on conventional turf maintenance of the same areas.
Sheep provide an environmentally sound alternative for turf maintenance. Sheep are quiet and easily herded. Their droppings enhance the soil, and they reduce or eliminate pesticide use and dependency on fossil fuels. They also create by-products of meat and wool and are aesthetically pleasing. Other municipalities in Alberta have initiated sheep programs. These include a program at the City of Calgary's Olympic Park, as well as a number of golf courses.
Start date: June 1992
Contact: Don Siemens, Parks Department
City of Fort Saskatchewan
10005-102 Street
Fort Saskatchewan AB T8L 2C5
Tel (403) 992-6277 Fax (403) 992-1375

Wastewater Management

The primary link between wastewater treatment and urban agriculture rests with the production of organic sludge as a by-product of the treatment process. Canadian municipalities generate thousands of tons of sludge annually. Traditionally, this sludge was collected from municipal treatment plants and disposed of in municipal landfill sites. However, the growing recognition that the by-product of the wastewater treatment process can be used as a high quality, cost-effective fertilizer, is leading an increasing number of Canadian municipalities to implement wastewater reuse projects.

Wastewater reuse
The review of Canadian municipal initiatives in the area of wastewater reuse identified quite a number of programs focusing on the reuse of sludge, or wastewater biosolids. In all cases, the municipality is required to treat the sludge before it can be applied for other purposes. At a minimum, this treatment process involves drying the sludge in a process known as "de-watering", and mixing it with an agent such as peat or sawdust. In some cases, the resulting fertilizer is applied to agricultural lands in the region surrounding a city. The effectiveness of this approach can be measured not only in terms of significant reductions of sludge being sent to landfills, but in increases in agricultural yields. In one case, oats showed a 46 percent increase in yield when treated with wastewater sludge.

In addition to agricultural applications, sludge is also used as a fertilizer for municipal parks maintenance. Case Study 7 presents an example of this type of initiative.

Wastewater reduction
To a lesser extent, wastewater management and urban agriculture are also related by virtue of municipal programs which aim to reduce the amount of wastewater produced. In this case, residents in several municipalities are being encouraged to take measures which would reduce

the amount of stormwater travelling directly from residential properties into municipal sewer systems. In some cases, residents are being encouraged to use storm runoff from roof drain pipes for gardening and lawn watering. These initiatives are often refered to as "downspout disconnection" programs.Residents are encouraged to disconnect their downspouts in order to reduce the incidence of basement flooding, in order to realize cost savings through less lawn and garden watering, and minimize costly sewer construction.

CASE STUDY 7 Town of Gander, Newfoundland Pop. 10,339
Name: Sludge Utilization Program
Objectives: The goal of the program is to divert 100 percent of the sludge taken from one of the Town's two wastewater treatment centres which, until now, were dumped at the local landfill.
Origins: Wastewater sludge produced by the municipality was recognized as a non-toxic and, odour-free resource and was considered too valuable to simply have it dumped in the environmentally-approved landfill sites.
Summary: Dry sewage sludge from the larger of the municipality's two treatment centres is mixed with shredded peat and sawdust and treated with lime in order to form a manufactured topsoil product used in a municipal sod farm. Sods will be used in recreational fields, municipal parks, and lawn repair. The sludge is currently used in flower pots at the treatment plant, which is full of flowerpots using sludge as fertilizer.
The Department of Public Works is responsible for all aspects of the program, though the Department of Recreation will also be using the sod.
The Town had also considered bagging and selling the sludge at garden centres. However, this was not considered commercially viable.
Start date: The program began during the summer of 1995. A site was selected for composting the sludge and growing the sod. The first crop of sod will be ready for the summer of 1996.
Contact: Cluny Matchim, Director of Public Works
Town of Gander
PO Box 280
Gander NF A1V 1W6
Tel (709) 651-2930 Fax (709) 256-2124

Water Resources Management

The sixth and final area being considered in this review of Canadian municipal initiatives relates to municipal water resources management. In this case, municipal priorities of conservation and resource use reduction are in conflict with the promotion of urban agricultural activities. As a result of municipal priorities, residents are being encouraged to reduce their use of water generally, and for outdoor activities in particular. In so far as urban gardening is perceived by municipalities as a primarily recreational activity, municipalities will treat the use of water for this, and related activities, as expendable. At the same time, municipalities which recognize the value and importance of urban gardening are encouraging the more efficient use of water for gardening, rather than discouraging its use outright.

Restrictions on outdoor watering
Faced with problems of excessive peak load and insufficient pressure, municipalities are increasingly turning to mechanisms for reducing water consumption. The programs of relevance to UA can be divided into three categories. The first includes a range of restrictions on outdoor watering. Lawn watering and other outdoor uses of water can increase daily demand for water by the equivalent of the daily production of a typical water plant. In order to enforce these restrictions, some programs are grounded in municipal by-laws, with compliance enforced by municipal staff. However, most programs are based largely on educational initiatives which encourage residents to voluntarily reduce their consumption of excess water, and provide various hints to this end. While the focus of these programs is on lawn watering and summer recreational activities, tap-watering of gardens is also mentioned as an activity to be curtailed.

Water-efficient gardening techniques
A second category of programs focuses on promoting water-efficient gardening techniques. Most popular in this regard is the use of xeriscaping techniques at municipal facilities and parks. This involves low water plants and natural vegetation which have reduced maintenance requirements, and require substantially less water.

Water metering
A third category involves the installation of residential water meters. Metering programs are often accompanied by changes in water pricing structures which promote substantial reductions in the use of water. However, these programs often meet with resistance from the public who have grown accustomed to inexpensive water, and are reluctant to pay for the installation of meters. The next impact of metering on urban agriculture is to reduce the reliance on water for outdoor gardening.

CASE STUDY 8 Regional Municipality of Ottawa-Carleton, Ontario Pop. 678,147
Name: Wise Use of Water Public Education Program
Objectives: The program was developed within the context of a wider Water Efficiency Strategy. The goal of the strategy is to maintain or improve life styles and the environment related to water use at the lowest cost to the customer. The Wise Use of Water Public Education Program is intended to raise awareness and provide tips on how to reduce the amount of water wasted.
Origins: The Region's Water Efficiency Strategy was developed in response to the Provincial Government's target of zero growth in water use to the year 2011. The Wise Use of Water Public Education Program was approved at a regional committee meeting in 1991.
Summary: The program is divided into three phases. The first phase of the program targeted residential customers, and was launched during National Drinking Water Week. Phase II targets industrial and commercial customers. Phase III will target school children. The program includes a water-efficient garden; this demonstrates how plant choices, xeriscaping techniques, and water-saving devices, such as rain barrels, soak hoses, timers, and rain gauges, can significantly reduce water use outside the home. Outside-home water is the most expensive to provide.
Start date: 1991

Contact: Trish Johnson-Cover, Manager, Water Efficiency Branch
Environmental Services Department
Regional Municipality of Ottawa-Carleton
111 Lisgar Street
Ottawa ON K2P 2L7
Tel (613) 724-4244 Fax (613) 728-4183

International initiatives
*Wastewater reclamation and purification project: Communauté urbaine de Dakar, Sénégal-Communauté urbaine de Montréal, Québec
The purpose of the project was to engage suitable methods of purifying and recycling wastewater from industry. Secondary concern included better management of municipal septic tanks. Fishing has a dominant place in the local economy. Dakar releases 15,000 cubic metres of liquid waste into the ocean every day.

*Water treatment and recuperation project: Agadir, Morocco-Ville de Chambly, Québec
The project sought to help Agadir treat and recycle sewage and other wastewater. Agadir dumps virtually untreated effluent directly into the sea. Treating and recycling wastewater for industrial use would have a potentially positive impact on human, economic and environmental health.

Conclusion

This review of Canadian municipal initiatives related to urban agriculture suggests several points regarding the support and promotion of UA by Canadian municipalities. The first is that although UA per se is not an explicit program priority on Canadian municipal agendas, there is a range of relevant initiatives in the areas of solid waste management, urban forestry, urban gardening, urban husbandry, wastewater management and water resources management. In Canada, these initiatives which have an impact on urban agriculture tend to be motivated by the following criteria:

- Cost-savings
- Waste reduction/conservation
- Availability of seed funding from provincial and federal governments
- Enhancement of the urban environment
- Promotion of recreational activities

The impact of this agenda on the promotion of urban agricultural activities is particularly positive in the case of initiatives related to composting, urban forestry, and wastewater reuse. A more limited, though positive, contribution to UA is also taking place through initiatives in the areas of urban husbandry and urban gardening.

Water conservation raises the point that this may run counter to the encouragement of urban agricultural activities, where UA is treated by municipalities as primarily recreational gardening.

UA actually comprises a number of production systems which use little water and encourage the conservation of water resources.

In light of the findings of this review, the future of municipal involvement in UA appears positive. The confluence of the UA agenda and the municipal agenda continues to benefit the range of UA activities, even though the arguments promoting the confluence may often differ from those prevalent in developing countries.

References

Federation of Canadian Municipalities. Canadian Municipal Environmental Directory. A compendium of initiatives, contacts and documents. Ottawa: FCM, 1995.

Federation of Canadian Municipalities. International Municipal Partnerships: Initiatives for Sustainable Community Development. Draft. February 27, 1995.

APPENDIX 1 Municipal Initiatives by Category

Solid Waste Management

Home composting

Backyard composter distribution. Kootenay Boundary Regional District, British Columbia
Home composter program. City of North Vancouver, British Columbia
Backyard composting programs. City of Richmond, British Columbia
Backyard composters. City of Vancouver, British Columbia
Composter program. Township of Goulbourn, Ontario

Composting information and education

Community Newsletter. Village of Port Clements, British Columbia
Waste Action Newspaper. City of Ottawa , Ontario
Victoria compost education centre. Capital Region District, British Columbia

Centralized composting

Composting site. Ville de St. Hubert, Québec
Three-stream waste collection. District of Mission, British Columbia
Community composting initiatives. City of Richmond, British Columbia
Christmas tree recycling. City of Vancouver, British Columbia
Leaf composting facility. City of Vancouver, British Columbia
Yard waste composting facility. City of Vancouver, British Columbia
Wet/dry recycling pilot project. District of Lunenburg, Nova Scotia
Wet/dry recycling program. City of Guelph, Ontario
Centralized composting facility. District of Summerland, British Columbia
Whynott's settlement recycling and composting facility. District of Lunenburg, Nova Scotia

Municipal solid waste strategies

Solid waste strategy. City of Fort Saskatchewan, Alberta
Waste management master plan. City of Airdrie, Alberta
Fully integrated recycling program. Town of Okotoks, Alberta
Master composter and recycling program. City of Edmonton, Alberta
City green strategy. City of Cambridge, Ontario
Waste reduction by composting. Town of Brooks, Alberta

Alternative uses

Fish composting. Alberni-Clayoquot Regional District. British Columbia

Urban Forestry

Planting on private property

Tree planting program. Town of Cardston, Alberta
New homeowner tree program. City of Medicine Hat, Alberta
Annual tree and compost distribution. Ville de Charlesbourg, Quebec

Planting on municipal property

Annual tree-planting program. Ville de Chemy, Québec
Greening initiatives. Ville de Trois Rivières, Québec
Tree program. Ville de Répentigny, Québec
Park beautification. County of Grand Prairie, Alberta

Trees by 2000. City of Red Deer, Alberta
Surrey re-leaf program. City of Surrey, British Columbia
Street tree-planting. City of Vancouver, British Columbia
Thomas Howe demonstration forest. Town of Gander, Newfoundland
Treeplan Canada-Green streets Canada. Town of Gander Newfoundland
Raised sidewalks for urban tree planting. Ville de Québec, Québec
Tree planting program. Ville de Tracy, Québec

Tree preservation

Heritage trees preservation. City of Richmond, British Columbia
Tree preservation and replacement by-law. City of Surrey, British Columbia
Tree policy. City of Richmond, British Columbia
Tree protection program. City of Vancouver, British Columbia
Tree protection techniques. Ville de Québec, Québec
Tree preservation. Ville de Saint-Eustache, Québec
Biological tree spraying. City of Halifax, Nova Scotia
Dutch elm disease control. Communauté urbaine de Québec, Québec
Preservation of wooded lands. Ville de Saint-Eustache, Québec
Transplanting of plant material for development sites. Township of Goulbourn, Ontario

Municipal urban forestry strategies

Urban forest management framework. Ville de Montréal, Québec
Urban forest management plan. City of Medicine Hat, Alberta

Urban Gardening

Demonstration gardens

Recycling depot and compost demonstration garden. City of Richmond, British Columbia
Jack Holland School Garden. Whitehorse, Yukon

Organic gardening courses

Environmental Education Programs. City of Edmonton, Alberta
Environmental Resource and Education Centre. City of Burnaby, British Columbia

Community gardening programs

See CFP Report #11

Urban Husbandry

Wastewater Management

Wastewater reuse

Agricultural application of municipal biosolids. City of Prince George, British Columbia
Sludge storage and agricultural use. Regional Municipality of Halton, Ontario
Agricultural uses for wastewater sludge. Ville de Jonquière, Québec
Sludge from the purification plant as fertilizer. Ville de Montréal, Québec
Wastewater treatment upgrade. City of Estevan, Saskatchewan

Wastewater reduction

Downspout disconnection program. Borough of East York, Ontario

Downspout disconnection. City of Toronto, Ontario

Water Resources Management

Restrictions of outdoor watering

Lawn watering restrictions. City of Vancouver, British Columbia
Reducing outdoor water consumption. Ville de Laval, Québec
Monitoring of lawn watering. Ville de Saint-Eustache, Québec
Water is not an inexhaustible resource. Ville de Montréal, Québec
Water watch newsletter. Municipality of Metropolitan Toronto, Ontario

Water-efficient gardening techniques

Water Conservation and Xeriscaping. City of Regina, Saskatchewan

Water metering and conservation

Universal water metering. City of Vernon, British Columbia
Installation of water meters. Town of Parry Sound, Ontario

Appendix 2 List of Municipal Contacts

Alberta

City of Edmonton
No.1 Sir Winston Churchill Square
Edmonton AB T5J 2R7
Tel (403) 496-8200 Fax (403) 496-6747

City of Fort Saskatchewan
10005-102 Street
Fort Saskatchewan AB T8L 2C5
Tel (403) 992-6200 Fax (403) 998-4774

City of Medicine Hat
580-1st Street S.E.
Medicine Hat AB T1A 8E6
Tel (403) 529-8220 Fax (403) 529-1690

City of Red Deer
PO Box 5008
Red Deer AB T4N 3T4
Tel (403) 342-8111 Fax (403) 346-6195

British Columbia

Alberni-Clayoquot Regional District
3008-5th Avenue
Port Alberni BC V9Y 2E3
Tel (604) 720-2700 Fax (604) 723-1327

Capital Regional District
PO Box 1000
Victoria BC V8W 2S6
Tel (604) 360-3000 Fax (604) 360-3130

City of Burnaby
4949 Canada Way
Burnaby BC V5G 1M2
Tel (604) 294-7944 Fax (604) 294-7529

City of Prince George
505 Fourth Avenue
Prince George BC V2L 3H2
Tel (604) 561-7500 Fax (604) 561-7502

City of Richmond
6911 No.3 Road
Richmond BC V6Y 2C1
Tel (604) 278-5511

City of Surrey
14245-56th Avenue
Surrey BC V3X 3A2
Tel (604) 591-4113 Fax (604) 591-8693

City of Vancouver
453 West 12th Avenue
Vancouver BC V5Y 1V4
Tel (604) 873-7011 Fax (604) 873-7685

Greater Vancouver Regional District
4330 Kingsway
Burnaby BC V5H 4G8
Tel (604) 432-6200 Fax (604) 432-6251

Newfoundland

Town of Gander
PO Box 280
Gander NF A1V 1W6
Tel (709) 651-2930 Fax (709) 256-2124

Nova Scotia

City of Halifax
PO Box 1749
Halifax NS B3J 3A5
Tel (902) 421-6428 Fax (902) 421-2805

District of Lunenburg
PO Box 200
Bridgewater NS B0A 1M0
Tel (902) 543-8181 Fax (902) 543-7123

Ontario

City of Guelph
59 Carden Street
Guelph ON N1H 3A1
Tel (519) 837-5604 Fax (519) 837-5635

City of Ottawa
111 Sussex Drive
Ottawa ON K1N 5A1
Tel (613) 244-5300 Fax (613) 244-5396

City of Port Colborne
239 King Street
Port Colborne ON L3K 4G8
Tel (905) 835-2900 Fax (905) 834-5746

City of Toronto
100 Queen Street West
Toronto ON M5H 2N2
Tel (416) 392-9111 Fax (416) 392-1553

Municipality of Metropolitan Toronto
55 John Street
Toronto ON M5V 3C7
Tel (416) 392-8000 Fax (416) 392-2980

Regional Municipality of Halton
1151 Bronte Road
Oakville ON L6M 3L1
Tel (905) 825-6161 Fax (905) 825-8822

Regional Municipality of Ottawa-Carleton
111 Lisgar Street
Ottawa ON K2P 2L7
Tel (613) 560-2058 Fax (613) 560-1380

Township of Goulbourn
PO Box 189, 2135 Huntley Road
Stittsville ON K2S 1A3
Tel (613) 831-2832 Fax (613)831-2279

Québec
Communauté Urbaine de Montréal
2, Complèxe Desjardins
Montréal(Québec) H5B 1E6
Tel (514) 280-3535 Fax (514) 282-0241

Communauté Urbaine de Québec
399, rue St. Joseph est
Québec(Québec) G1K 8E2
Tel (418) 529-8771 Fax (418) 529-4299

Ville de Jonquière
CP 2000
Jonquière (Québec) G7X 7W7
Tel (418) 546-2222 Fax (418) 699-6018

Ville de Laval
1, place du Souvenir
Laval (Québec) H7V 1W7
Tel (514) 662-4422 Fax (514) 662-5213

Ville de Lévis
22, côte du Passage
Lévis(Québec) G6V 5T4
Tel (418) 838-4000 Fax (418) 838-4051

Ville de Montréal
275, rue Notre-Dame est
Montréal (Québec) H2Y 1C6
Tel (514) 872-3142 Fax (514) 872-5655

Ville de Québec
CP 700
Québec (Québec) G1R 4S9
Tel (418) 691-6200 Fax (416) 691-7219

Ville de Saint-Eustache
145, rue St-Louis
Saint Eustache (Québec) J7R 1X9
Tel (514) 472-4440 Fax (514) 472-2493

Ville de St-Hubert
5900, boulevard Cousineau
St-Hubert (Québec) J3Y 7K8
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